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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Docket No: Q57433

Kiyoshi TAKEI, et al.

Appln. No.: 09/482,099

Group Art Unit: 2828

Confirmation No.: 6543

Examiner: Delma R. Flores Ruiz

Filed: January 13, 2000

For: DISTRIBUTED FEEDBACK TYPE SEMICONDUCTOR LASER DEVICE AND  
METHOD OF MANUFACTURING THE SAME

**RESPONSE UNDER 37 C.F.R. § 1.111**

**MAIL STOP NON-FEE AMENDMENT**

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

In response to the Office Action dated November 21, 2003, please consider the remarks as submitted herewith on the accompanying pages.

**REMARKS**

Claims 1-5 are all the claims pending in the application. Claims 4 and 5 have been withdrawn from consideration by the Examiner as being drawn to a non-elected invention. Reconsideration and allowance of all the claims are respectfully requested in view of the following.

**Claim Rejections - 35 U.S.C. § 102**

The Examiner rejected claims 1-3 under §102(b) as being anticipated by US Patent 5,982,804 to Chen et al. (hereinafter Chen). Applicants respectfully traverse this rejection because Chen fails to disclose all the elements as set forth in the claims.

Claim 1 sets forth “[a] DFB type semiconductor laser device comprising:

a laser part including an active layer and a clad layer;  
a grating layer mounted on said clad layer and having periodic apertures;  
an insulating layer mounted on said grating layer, said insulating layer including at least one elongated gap extending in a direction transverse to the grating of said grating layer; and  
a metal electrode layer mounted on said insulating layer so as to contact through said apertures of said grating layer with said clad layer within said gap.”

For example, in one non-limiting embodiment, the metal electrode layer 20 having a high refractive index contacts through apertures of the grating layer 7a with the clad layer 6 within the gap 8a of the insulating layer 8 being above a portion in which a laser light is generated. Thus, a semiconductor material of the grating layer 7a and a metal material 20 (having a high refractive index) are alternately disposed onto a surface of the upper clad layer 6. Thus, the generated laser light can be confined in a three dimensional area of a wave guide layer without forming any ridge by alternately disposing the materials having much difference in a refractive index 7a, 20 onto a part of a surface of the upper clad layer 6. In this respect, please note page 8, lines 20-29 in the specification.

On the other hand, Chen discloses a grating layer 20 provided on regions on both sides of the ridge 15, wherein the ridge 15 is above a portion in which a laser light is generated. However, Chen does not disclose a grating formed above a portion in which a laser light is generated. In this respect, please see col. 3, lines 31-34, as well as Figs. 7 and 8. And Chen discloses gratings 20 in the clad layer 12. Thus, there is a big difference in characteristics between the grating according to the presently claimed invention, as set forth in claim 1, and the grating taught by Chen. Furthermore, in the laser device taught by Chen, the ridge confines the generated laser light in a three dimensional area of the SCH active layer 11. Thus, with respect to confining a generated laser light, the laser device taught by Chen is quite different from the laser device according to the invention of claim 1.

For at least any of the above reasons, Chen fails to anticipate claim 1. Likewise, this reference fails to anticipate dependent claims 1-3.

**Claim Rejections - 35 U.S.C. § 103**

The Examiner rejected claim 3 under §103(a) as being unpatentable over Chen in view of US Patent 5,539,763 to Takemi et al. (hereinafter Takemi). Applicants respectfully traverse this rejection because the references fail to teach or suggest all the elements as set forth in the claims.

As noted above, Chen fails to disclose all the elements as set forth and arranged in claim 1. The Examiner cites Takemi as teaching a clad layer having a thickness equal to or thinner than 0.5  $\mu\text{m}$ .<sup>1</sup> But Takemi fails to cure all the deficiencies in Chen.

Takemi discloses that the p type InP cap layer 108a contacts through apertures of the grating layer 107 with the upper cladding layer 106a within the gap of the insulating layer 11 being above a portion in which a laser light is generated. But Takemi does not teach or suggest that a semiconductor material of a grating layer and a metal material having a high refractive index are alternately disposed on the surface of the upper clad layer.

Accordingly, even if one of ordinary skill in the art were motivated to combine Chen and Takemi as suggested by the Examiner, any such combination would still not include a metal material having a high refractive index and a semi-conductor that are alternately disposed on the surface of the upper clad layer, as set forth in claim 3.

For at least any of the above reasons, Chen and Takemi fail to render obvious claim 3.

**Conclusion**

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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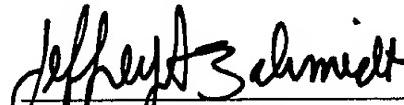
<sup>1</sup> Office Action at page 4, 1<sup>st</sup> paragraph.

**Response Under 37 C.F.R. § 1.111**  
**US Appln. 09/482,099**

**Atty. Docket: Q57433**

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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